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carriage, wherein the metal is selected from the group consisting of aluminum, beryllium, copper, gold, silver, zinc tungsten and alloys of two or more of the foregoing.

Claim 32 (amended) A substrate carrier for an ink jet printer comprising a molded or cast metal body containing a substantially planar substrate surface and four sides essentially perpendicular to the substrate surface, the substrate surface including one or more substrate locator wells each having a well base for attaching thereto one or more semiconductor substrates, at least one ink feed slot in the base of the well for flow of ink from an ink reservoir attached to the body of the carrier through a cylindrical ink feed chamber in the body to the ink feed slot, the ink feed chamber being disposed on an opposing side of the substrate carrier from the substrate locator well, wherein at least one of the four sides has a substantially planar surface devoid of fins extending from the substrate surface essentially perpendicular thereto for containing contact pads for electrical contact from a printer to the substrates on the body, and at least two of the four sides contain cooling fins.

REMARKS

Claims 1-22 and 25-39 are in the case. Claims 1, 14, 25 and 32 are amended to more clearly and distinctly claim the invention. Support for the amendment to the claims relating to the ink chamber can be found in Figs. 1B, 3B, 4B, 5B and 5C and in the specification on page 8, lines 3-7, page 12, lines 9-14 and page 13, lines 12-19. Support for the side wall devoid of fins can be found in Figs. 1A, 3B, 5A and 5C and in the specification on page 11, lines 14-18 and page 13, lines 9-11. No new matter is added to the case by the amendment.

Applicants greatly appreciate the courtesies extended to the undersigned by the examiner during telephone interviews conducted between the undersigned and the examiner on September 7 and 8, 2000, wherein the invention and cited references were discussed. The following remarks incorporate the substance of the interview.

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In the office action, Claims 1-5 and 10-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,942,408 to Braun in view of U.S. Patent No. 5,066,964 to Fukuda et al. and U.S. Patent No. 4,296,421 to Hara et al. Claims 6 and 7 were rejected as being unpatentable over the '408 patent in view of the '964 patent and the '421 patent and further in view of U.S. Patent No. 5,426,458 to Wenzel et al. Claim 8 was rejected as being unpatentable over the '408 patent in view of the '964 patent and the '421 patent and further in view of U.S. Patent No. 5,079,189 to Drake et al. Claim 9 was rejected as being unpatentable over the '408 patent in view of the '964 patent and the '421 patent and further in view of U.S. Patent No. 5,834,689 to Cook. Claim 13 was rejected as being unpatentable over the '408 patent in view of the '964 patent and the '421 patent and further in view of U.S. Patent No. 4,755,836 to Ta et al. Claims 14-18 were rejected as being unpatentable over the '408 patent, in view of the '964 patent, the '421 patent, the '836 to Ta et al. and U.S. Patent No. 5,278,584 to Keefe et al. Claims 19 and 20 were rejected as being unpatentable over the '408 patent, in view of the '964 patent, the '421 patent, the '836 patent, the '584 patent and further in view of the '458 patent. Claim 21 was rejected as being unpatentable over the '408 patent in view of the '964 patent, the '421 patent, the '836 patent, the '584 patent and further in view of the '189 patent. Claim 22 was rejected as being unpatentable over the '408 patent in view of the '964 patent, the '421 patent, the '836 patent, the '584 patent and further in view of the '689 patent. Claims 25-28 and 31 were rejected as being unpatentable over the '408 patent in view of the '964 patent, the '421 patent, the '836 patent and U.S. Patent No. 5,084,713 to Wong. Claims 29-30 were rejected as being unpatentable over the '408 patent in view of the '964 patent, the '421 patent, the '836 patent, the 713 patent and further in view of the '458 patent. Claims 32-35 and 38-39 were rejected as being unpatentable over the '408 patent in view of the '964 patent, the '421 patent and the '584 patent. Claims 36 and 37 were rejected as being unpatentable over the '408 patent in view of the '964 patent, the '421 patent and the

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'584 patent and further in view of the '458 patent. All the rejections and objection are respectfully traversed.

In the interview with the examiner, Applicants asserted that the primary reference, U.S. Patent No. 4,942,408 to Braun failed to suggest any structure outside of the reservoir housing for cooling the fluid block 50. It is Applicants' position that the '408 patent does not suggest the combination of references being made since there is nothing in the '408 patent with regard to cooling the chip with an external cooling means such as cooling fins. Reference is made to column 4, lines 35-41 wherein use of a heat sink element attached to the bottom of the chip is described. However, as set forth in U.S. Patent No. 5,084,713, which was filed after the '408 patent issued, "... attachment of a metal heat sink unit (e.g. a manifold) adjacent the resistor assembly..." has proven to be impractical from a technical and economic standpoint. While the '713 patent is no longer being applied against most of the claims, it is clear that the '713 patent teaches away from use of a heat sink element as described in the '408 patent and this teaching cannot be ignored.

A. Claims 1-5 and 10-12 are Patentably Distinguished from the Cited References.

As described previously, the claimed invention calls for a structure for an ink jet printer comprising a substrate holder having a top surface having a perimeter. To top surface of the substrate holder also contains one or more substrate locator wells, each of the wells having a base and at least one ink feed slot disposed in the base of the wells. The substrate holder also contains side walls attached to the top surface along the perimeter thereof. At least one of the side walls contains fins for convectively removing heat from the substrate holder. It is Applicants' position that the combined references fail to provide all of the elements of the claimed invention.

With regard to the rejection of the claims, the primary reference applied against the claims is the '408 patent. In the background of the '408 patent, the patentees

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describe the manifest difference between a printhead ejecting drops in a direction parallel to the surface of the heater elements and ejecting drops in a direction normal to the heater element surface. U.S. Patent No. 4,330,787 is said to describe several advantages of the category of printheads ejecting drops normal to the heater element surface. (See column 1, lines 14-23 of the '408 patent.) The invention of the '408 patent is said to be directed to the normal drop ejection kind of printhead. Hence, the '408 patent leads away from a combination with a printhead having parallel drop ejection such as described in the '964 and '421 patents.

The '964 patent to Fukuda et al. describes a heat capacity member for a printhead having an ejection path parallel to the surface containing the drop ejection devices. There is nothing in the '964 patent with regard to printheads having drop ejection normal to the surface containing the drop ejection devices. Accordingly, this reference is not properly combined with the '408 patent. Furthermore, the '964 patent requires that the printhead have a liquid-path formed by the heat-capacity member to promote heat exchange. (See column 4, lines 4-6 and column 5, lines 4-17 of the '964 patent.) The requirement of a liquid path in the heat-exchange member is substantially different than simply using a heat sink as described in the '408 patent since the '964 patent requires both liquid circulation and contact between the chip and the heat-capacity member and not simply contact between the chip and a heat sink. The '964 patent solves a similar problem in a different way than the '408 patent and thus cannot said to be combinable with the solution provided by the '408 patent. The two solutions are mutually exclusive and thus cannot be combined to provide the invention.

Furthermore, it is Applicants' position that the '964 patent does not direct one to modify the '408 patent to provide cooling fins outside of the ink reservoir body. There is nothing in the '408 patent with regard to cooling fins. Accordingly, no motivation to combine the references to provide Applicants' invention has been shown.

The '421 patent is also not properly combined with the '408 and '964

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patents. The '421 patent, like the '964 patent only relates to printheads having drop ejection parallel to the surface to which the chip is attached. Accordingly, there is nothing in the '421 patent which would suggest this reference be combined with the '408 patent to provide Applicants' claimed invention. Furthermore, unlike the other references, the '421 patent requires a heat sink whereby temperature is controlled within a specified limit by use of a Peltier cooler, heat discharging fin and fan. There is nothing in the '421 patent with regard to providing a liquid path in the heat exchange member or cooling the base plate with any means other than the three means described in combination. Again, the '421 patent solves a similar problem in a different way than either the '408 or '964 patents.

It is improper to dissect the references to extract portions of the teachings with regard to cooling the chip while ignoring the teachings of the references as a whole with regard to the aspects being combined. There simply is nothing in the references to suggest the combination made by the Examiner and for this reason alone, all of the rejections applying the combination of the '408, '964 and '421 patents is untenable and should be withdrawn.

It is clear that there must be more than simply itemizing the elements in the prior art and combining the elements to provide Applicants' invention. As the court stated in Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983), "... virtually all [inventions] are combinations of old elements." Identification of the elements in the prior art is not sufficient, however, to negate patentability, otherwise few patents would ever issue. "To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." In re Rouffet, 47 USPQ2d 1453, 1457, 1458 (Fed. Cir. 1998).

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In all of the rejections, the examiner has failed to show motivation to combine the references in the manner they are combined.

"To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction -- an illogical and inappropriate process by which to determine patentability. *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985)." *Sensonics Inc. v. Aerosonic Corp.*, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996).

When the references are in the same field as that of Applicants' invention, the test for selecting specific teachings to combine, "... must still be met by identification of some suggestion, teaching, or motivation in the prior art, arising from what the prior art would have taught a person of ordinary skill in the field of the invention." Furthermore, evidence that supports, rather than negates patentability must also be considered. *In re Dance*, 48 USPQ2d 1635, 1637, 1638 (Fed. Cir. 1998).

Even if the references were combined, it is not clear how the combination would provide Applicants' invention. The '964 patent requires a liquid flow path in the heat capacity member, whereas the '421 patent requires a combination of a Peltier cooler, heat discharge fin and fan to cool a separate aluminum plate attached to the chip. Hence the combination would require a Peltier cooler, fin, cooling fan and liquid flow path in the heat-capacity member. Applicants' provide cooling by making the entire substrate holder out of a heat-conducting member containing fins. Accordingly, a Peltier cooler, fan and liquid flow path in the heat capacity member are not required as set forth in the combined references.

It is also submitted that the references, alone or in combination, fail to teach or suggest a chamber on the opposing side of the carrier from the locator wells. This

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element combined with the other elements of the invention is not found in the cited references. Accordingly, Claims 1-5 and 10-12 are patentable over the '408 in view of the '421 and '964 patents.

B. Claims 6-7 are Patentably Distinguished from the Cited References.

Claims 6-7 depend from Claim 1 and are patentable over the cited references for the same reasons Claims 1-5 and 10-12 are patentable over the '408, '964 and '421 references. The '458 patent to Wenzel et al. is combined with the foregoing references and is cited only for use of a polyxylylene coating. The '458 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '458 patent does not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claims 6-7 be reconsidered and withdrawn for all of the foregoing reasons.

C. Claim 8 is Patentably Distinguished from the Cited References.

Claim 8 depends from Claim 1 and is patentable over the cited references for the same reasons Claims 1-5 and 10-12 are patentable over the '408, '964 and '421 references. The '189 patent to Drake et al. is combined with the foregoing references and is cited only for use of a heat sink made of graphite. The '189 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '189 patent does not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claim 8 be reconsidered and withdrawn for all of the foregoing reasons.

D. Claim 9 is Patentably Distinguished from the Cited References.

Claim 9 depends from Claim 1 and is patentable over the cited references for the same reasons Claims 1-5 and 10-12 are patentable over the '408, '964 and '421

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references. The '689 patent to Cook is combined with the foregoing references and is cited only for use of a composite matrix material used as a package for housing an electrical device. The '689 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '689 patent does not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claim 9 be reconsidered and withdrawn for all of the foregoing reasons.

E. Claim 13 is Patentably Distinguished from the Cited References.

Claim 13 depend from Claim 1 and are patentable over the cited references for the same reasons Claims 1-5 and 10-12 are patentable over the '408, '964 and '421 references. The '836 patent to Ta et al. is combined with the foregoing references and is cited only for use of a alignment devices. The '836 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '836 patent does not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claim 13 be reconsidered and withdrawn for all of the foregoing reasons.

F. Claims 14-18 are Patentably Distinguished from the Cited References.

Claims 14-18 are directed to a method for making a print cartridge. The substrate carrier element of the method is patentable over the cited references for the same reasons Claims 1-5 and 10-12 are patentable over the '408, '964 and '421 references. The '836 patent to Ta et al. and the '584 patent to Keefe et al are combined with the foregoing references and are cited only for use of a alignment devices and a TAB circuit. The '836 and '584 patents do not cure the deficiencies of the other references to provide Applicants' claimed invention because the '836 and '584 patents do not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claims 14-18 be reconsidered and withdrawn for all of the foregoing reasons.

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G. Claims 19-20 are Patentably Distinguished from the Cited References.

Claims 19-20 depend from Claim 14 and are patentable over the cited references for the same reasons Claims 14-18 are patentable over the '408, '964, '421, '836 and '584 references. The '458 patent to Wenzel et al. is combined with the foregoing references and is cited only for use of a polyxylylene coating. The '458 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '458 patent does not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claims 19-20 be reconsidered and withdrawn for all of the foregoing reasons.

H. Claim 21 is Patentably Distinguished from the Cited References.

Claim 21 depends from Claim 14 and is patentable over the cited references for the same reasons Claims 14-18 are patentable over the '408, '964, '421, '836 and '584 references. The '189 patent to Drake et al. is combined with the foregoing references and is cited only for use of a heat sink made of graphite. The '189 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '189 patent does not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claim 8 be reconsidered and withdrawn for all of the foregoing reasons.

I. Claim 22 is Patentably Distinguished from the Cited References.

Claim 22 depends from Claim 14 and is patentable over the cited references for the same reasons Claims 14-18 are patentable over the '408, '964, '421, '836 and '584 references. The '689 patent to Cook is combined with the foregoing references and is cited only for use of a composite matrix material used as a package for housing an electrical device. The '689 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '689 patent does not suggest or

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describe the claimed elements set forth in detail above. It is requested that the rejection of Claim 22 be reconsidered and withdrawn for all of the foregoing reasons.

J. Claims 25-28 and 31 are Patentably Distinguished from the Cited References.

Claims 25-28 and 31 relate to a metal nose piece structure having a top surface containing substrate locator wells and ink feed slots and chambers on an opposing side from the wells. One or more of the side walls of the nose piece which are attached to the top surface along the perimeter thereof contain fins for heat removal, slots for attaching the nose piece to an ink reservoir and alignment devices. Claims 25-28 and 31 are patentable over the '408, '964 and '421 patents for the same reasons Claims 1-5 and 10-12 are patentable over these references. Likewise, Claims 25-28 and 31 are patentable over the '836 patent for the same reasons Claim 13 is patentable over the '836 patent. The '713 patent to Wong is combined with the foregoing references and is cited only for the cylindrical opening and alignment pins. The '713 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '713 patent does not suggest or describe the claimed elements set forth in detail above and in fact leads away from the claimed invention as established in the previous response to the office action. It is requested that the rejection of Claims 25-28 and 31 be reconsidered and withdrawn for all of the foregoing reasons.

K. Claims 29-30 are Patentably Distinguished from the Cited References.

Claims 29-30 depend from Claim 25 and are patentable over the cited references for the same reasons Claims 25-28 and 31 are patentable over the '408, '964, '421 and '836 patents. The '458 patent to Wenzel et al. is combined with the foregoing references and is cited only for use of a polyxylylene coating. The '458 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '458 patent does not suggest or describe the claimed elements set forth in

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detail above. It is requested that the rejection of Claims 29-30 be reconsidered and withdrawn for all of the foregoing reasons.

L. Claims 32-35 and 38-39 are Patentably Distinguished from the Cited References.

Claims 32-35 and 38-39 relate to a metal substrate carrier for an ink jet printer having a substantially planar substrate surface and four sides perpendicular to the substrate surface. The substrate surface contains locator wells and ink feed slots and chambers on an opposing side from the wells. At least one of the four sides has a substantially planar surface which is devoid of fins for containing contact pads for electrical connection to a printer. At least two of the four sides contain cooling fins. Claims 32-35 and 38-39 are patentable over the '408, '964 and '421 patents for the same reasons Claims 1-5 and 10-12 are patentable over these references. Likewise, Claims 32-35 and 38-39 are patentable over the '584 patent for the same reasons Claim 22 is patentable over the '584 patent. The '584 patent to Keefe et al. is combined with the foregoing references and is cited only for use of a TAB circuit. The '584 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention because the '584 patent does not suggest or describe the claimed elements set forth in detail above and in fact leads away from the claimed invention as established in the previous response to the office action. It is requested that the rejection of Claims 32-35 and 38-39 be reconsidered and withdrawn for all of the foregoing reasons.

M. Claims 36-37 are Patentably Distinguished from the Cited References.

Claims 36-37 depend from Claim 33 and are patentable over the cited references for the same reasons Claims 32-35 and 38-39 are patentable over the '408, '964, '421 and '584 patents. The '458 patent to Wenzel et al. is combined with the foregoing references and is cited only for use of a polyxylylene coating. The '458 patent does not cure the deficiencies of the other references to provide Applicants' claimed invention

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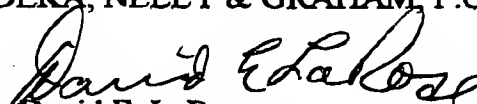
because the '458 patent does not suggest or describe the claimed elements set forth in detail above. It is requested that the rejection of Claims 36-37 be reconsidered and withdrawn for all of the foregoing reasons.

It is believed that this amendment and the interview are fully responsive to the office action dated August 9, 2000, and no further action need by taken by Applicants. Accordingly, Applicants respectfully submit that Claims 1-22 and 25-39 as amended are patentable over the cited references. Applicants therefore request that all of the rejections be withdrawn and Claims 1-22 and 25-39 be allowed at the earliest convenience.

Respectfully submitted,

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on September 20, 2000
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